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THIS DOCUMENT WAS CREATED AS INFORMATION FOR THE DENVER REGIONAL COUNCIL OF GOVERNMENTS FOR THE POSSIBLE STAPLETON AIRPORT EXPANSION. THE OBJECTIVE WAS TO CONDUCT A DETAILED ANALYSIS OF PROSPECTIVE AREAS ON ALTERNATIVE SITES AND PORTRAY THESE DATA IN A COMPARATIVE FORMAT. THE CRITERIA WAS THE PRESENCE OF ENDANGERED OR THREATENED PLANT SPECIES. THE FOCUS OF THE VEGETATIVE ANALYSIS WAS THE ROCKY MOUNTAIN ARSENAL AND THE MILE HIGH LAKES AREA.

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SUBTASK 15.8

Vegetation Factors

by

Janet Williams

Thorne Ecological Institute

July 29, 1981

Reviewed by
Haney
9/1/81

THORNE ECOLOGICAL INSTITUTE

4860 RIVERBEND ROAD
BOULDER, COLORADO 80301

A. OBJECTIVE

To conduct detailed analyses of prospective areas on alternative sites and portray these data in a comparative format.

B. CRITERIA

Presence of endangered or threatened plant species.

C. STUDY AREA

The focus of the vegetation analysis was the Rocky Mountain Arsenal and the Mile High Lakes Area. These were the most prospective areas identified during Phase I for the occurrence of endangered or threatened species.

D. METHODOLOGY

In subtask 12.11 published and unpublished literature was documented. Knowledgeable authorities on the vegetation of the study area were contacted and interviewed. Reconnaissance field trips were made.

In subtask 15.8 the following methodology was utilized:

1. The endangered, threatened and rare plant list of subtask 12.11 was updated and edited to form a more current and accurate list of the potential endangered plant species of the search area (see Appendix A). This was done with the help of knowledgeable authorities familiar with the plants on this list. A list of these authorities is given below:

NAME	POSITION	AGENCY	
Miriam Denham	Botanist	Univ. of Colo. Colo. Native Plant Soc.	442-1020
Bill Harmon	Professor	Univ. of N. Colo. Colo. Native Plant Soc.	351-2515
Jim Miller	Botanist	U.S. Fish & Wildlife	234-2496
Mike Olson	Botanist	Plant Info. Network	226-9389
Scott Peterson	Botanist	Colo. Natural Heritage Inventory	623-1913
Dave Thorne	Biologist	Rocky Mountain Arsenal	288-0711
William Weber	Professor	Univ. of Colo. Herbarium	492-6171
Dieter Wilkin	Professor	Colo. State Univ. Herbarium	491-6036

2. Herbarium specimens of these endangered species were studied and photographed. The herbariums visited were those at the University of Colorado, Colorado State University, Rocky Mountain Arsenal, and a personal herbarium of Miriam Denham of Boulder, Colorado.

3. Reconnaissance field trips were conducted to the alternative airport sites.

4. During the period from September 24 through October 20, 1980, more extensive surveys were conducted in areas still under consideration for airport development and labled as "Questionable" in subtask 12.11.

a. Plant communities were given a preliminary survey to establish the general nature of the composition (i.e. stable and native versus disturbed and "weedy").

b. Percentages of canopy coverages of various plant species within the communities were estimated. (Daubenmire, 1968.) These estimations are shown in Appendices B 1-5. Initial scanning was made for endangered plant species in the process.

c. If the previous two procedures produced information suggesting stable native plant communities or favorable environments for the occurrence of any of the plants listed as endangered, threatened or rare, these areas were given a more thorough survey.

5. Photographs were taken documenting the findings of this report and are included.

6. Analysis of plant communities and their relationships to endangered plant species:

a. The endangered, threatened or rare plants listed in Appendix A generally are depleted because their environments are diminishing. (The only species known to occur

in the area are the cactus.) These are plants which are hardy competitors with other plants for water, nutrients and sunlight, yet need specific conditions of stable and long-term plant communities to grow. If these stable communities are disturbed by, for instance, intensive livestock grazing or human activities, these plants disappear from the area.

b. Other species of plants are poor competitors with other plants in stable communities but thrive on severely disturbed soils. These are sometimes called "pioneer" species or "weeds" and generally consist of annual forbs (broad-leaved herbaceous plants) and annual grasses or graze-hardy perennial grasses. These plants often have a means of quick and long-range seed dispersion which enables them to colonize a disturbed site easily. These weedy plants can be indicators of the stability and health (or lack thereof) of a given plant community. If their coverage is great, the plant community may be considered to be in poor condition, and the likelihood of the occurrence of the endangered, threatened or rare plants listed is very low.

However, if a plant community appears to be stable and healthy (weedy coverage is low), the possibility of endangered, threatened or rare plant species growing in the community is fairly high (see Appendices B 1-5).

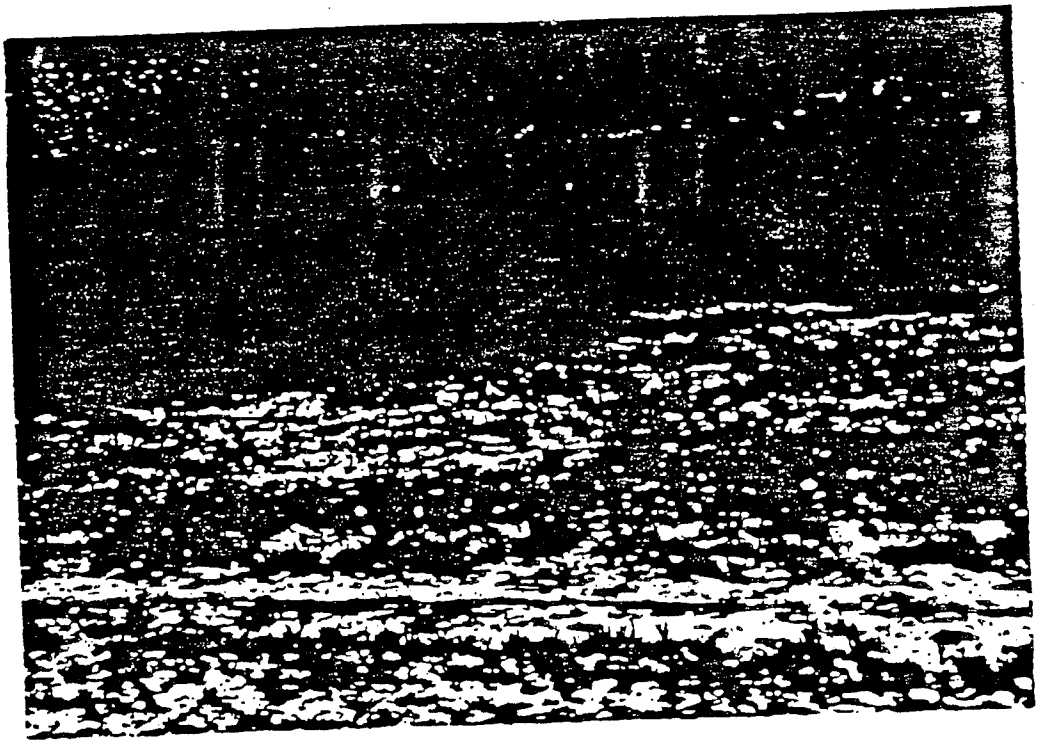
E. FINDINGS

1. Mile High Lakes

When the lakes were first visited in December of 1979, Thorne felt that the area had a reasonable potential for supporting healthy native plant communities. Cattle grazed the area, but this grazing pressure did not appear to be too intensive. However, after doing a more detailed survey of the area in a season more favorable to its study, it has become apparent that it is severely overgrazed.

These numerous lakes and marshy spots were expected to contain various native plant communities described in subtask 12.11 as potential vegetation and vegetation as it existed historically: Cottonwood gallery forests with a wealth of shrubs, grasses and forbs; tall grass communities including grasses of the relict true tall grass prairies, namely prairie cordgrass, big bluestem, switchgrass and indiangrass, among others; marsh botany in its native state is expected to contain several of the endangered plants; the alkali soils are expected to contain the characteristic salt meadows; drier sandy soils dominated by sand sage, needle-and-thread grass, sand dropseed, prairie reedgrass, etc.; and the shortgrass prairie is expected on other dry spots.

Some of the plants from communities mentioned above were found, but only as remnants of previously existing native communities. The existing vegetation consists primarily of weedy annual forbs and grasses or other plants which could withstand intensive livestock use (see Photograph 1). There are three primary community types found here: (1) The first is a cat-tail marsh community.



1. Grazing livestock with alkali soils in foreground (Mile High Lakes)

2. Great bulrush community (Mile High Lakes)

Here the vegatation coverage is composed almost exclusively of cat-tails. Few other plants can grow in these dense thickets. This plant is very common and can grow in wet disturbed sites. (2) The second type is a bulrush community. It occupies disturbed shallow water habitats similar to the cat-tail community. The bulrush found here grows with a few other plants, such as smartweed and American bulrush. Often these stands are clipped by cattle grazing in the area (Photographs 2 and 3). Some of the soil has no vegetation at all (Photograph 4). (3) The third community is found on drier land and is composed of plant species common to waste areas, such as Canadian thistle, smartweed, white sweetclover, tumbleweed, and a few grasses such as rabbitfoot grass and saltgrass (Photographs 5 and 6).

A study of the wildlife of the Mile High Lakes (and Rocky Mountain Arsenal) is not being attempted here. However, mention of the abundant wildlife, particularly of Rocky Mountain Arsenal, is useful in describing the importance and function of the vegetation communities of these areas as wildlife habitat. Thus the wildlife observations become helpful in preparing subtask 15.9 on wildlife.

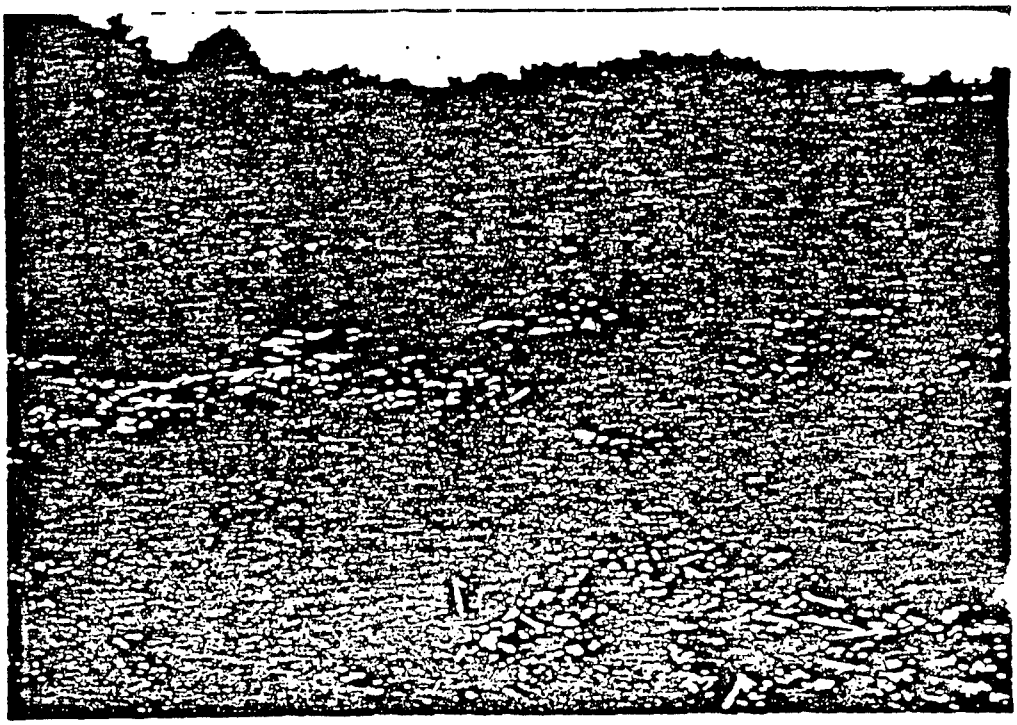
The Mile High Gun Club hunts here every fall because of the abundant waterfowl. Ducks and geese are abundant, as well as many other birds, including hawks. It should be noted that several great blue herons were observed.

Therefore, although the quality of the composition of the plant communities here is not special (Appendix B-1), the lakes and marshes of the area and the structure of the vegetation with

3. Great bulrush clipped by livestock grazing (Mile High Lakes)

4. Poor condition of some areas surrounding water (Mile High Lakes)

5. Annual forbs in pasture. Note lack of grasses (Mile High Lakes)



6. Tumbleweed, note lack of grasses (Mile High Lakes)

cottonwoods, tall cat-tails and bulrushes provide food and cover requirements for wildlife.

2. Rocky Mountain Arsenal

The Rocky Mountain Arsenal is being divided into six major study areas or types. They are:

a. Three shortgrass prairie communities.

b. Lake Mary, Ladora Lake, and Rod and Gun Club Pond.

c. Several sand sage communities.

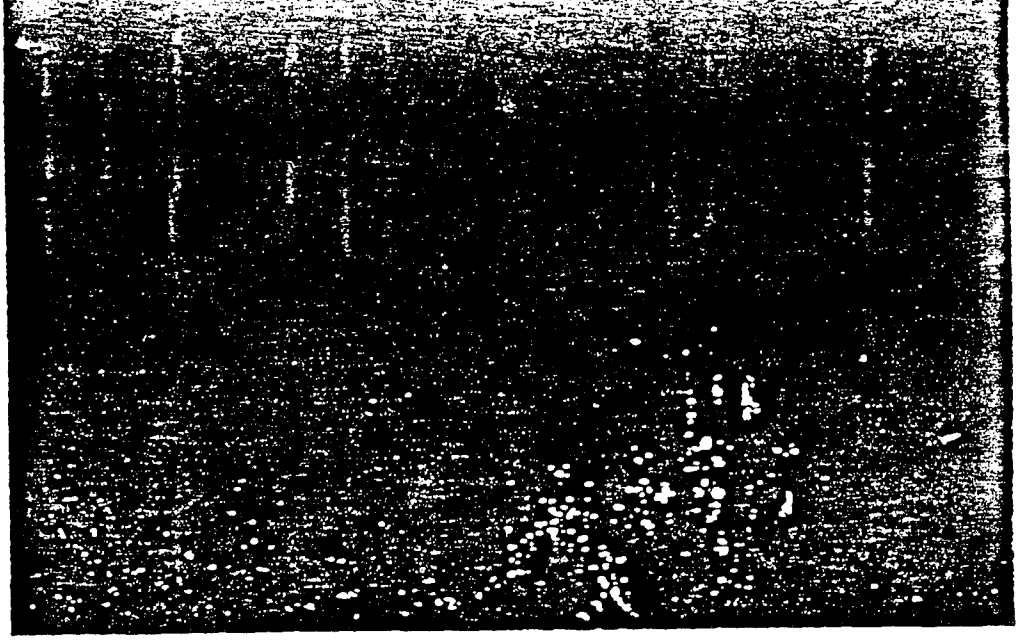
d. Upper and Lower Derby Lakes.

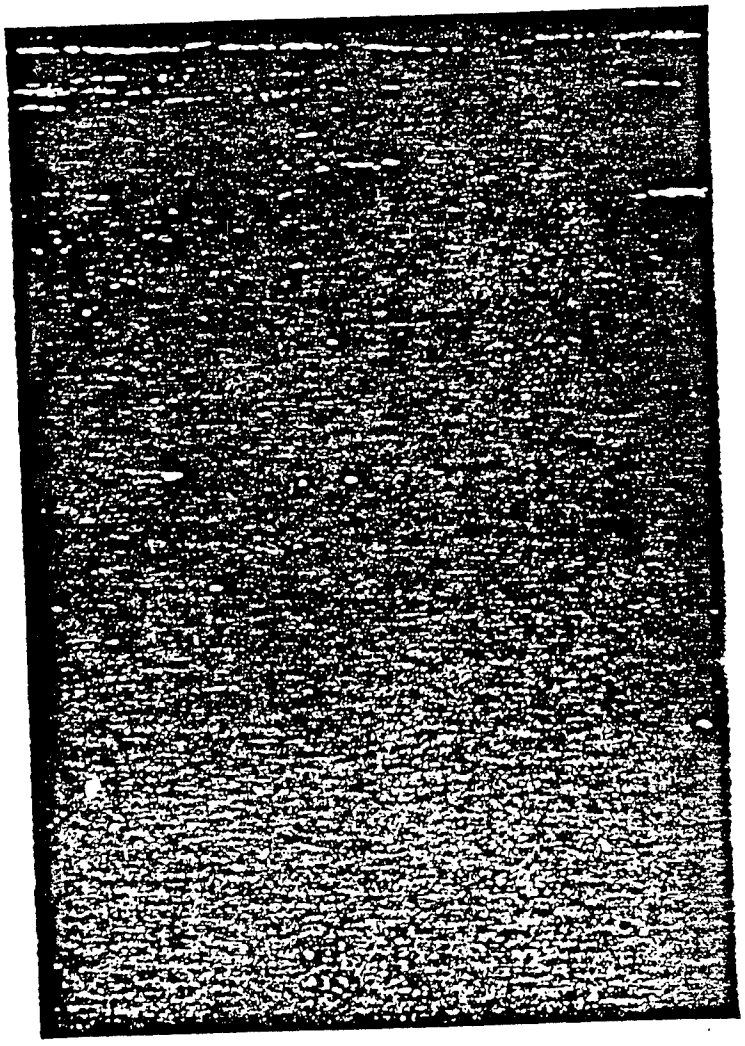
e. The First Creek drainage and the Derby canals.

f. The remainder of the Arsenal.

a. The three shortgrass prairie communities found in sections 19, 24, 33 and 35 are representative of the typical native high plains shortgrass prairies found at Pawnee National Grasslands in northeastern Colorado and described by Weaver and Albertson (1956), Kuchler (1964), and Mutel (1976), among others (Photographs 7 and 8). The shortgrass prairie community is considered to be the result of dry soil conditions (little rainfall or soils and topography resulting in rapid water runoff). It is also considered by some to have been a characteristic result of grazing pressure by wandering herds of buffalo when they roamed the high plains many years ago.

The dominant plants are blue grama grass and buffalo grass. Interspersed are prickly pear cactus (Opuntia spp.),





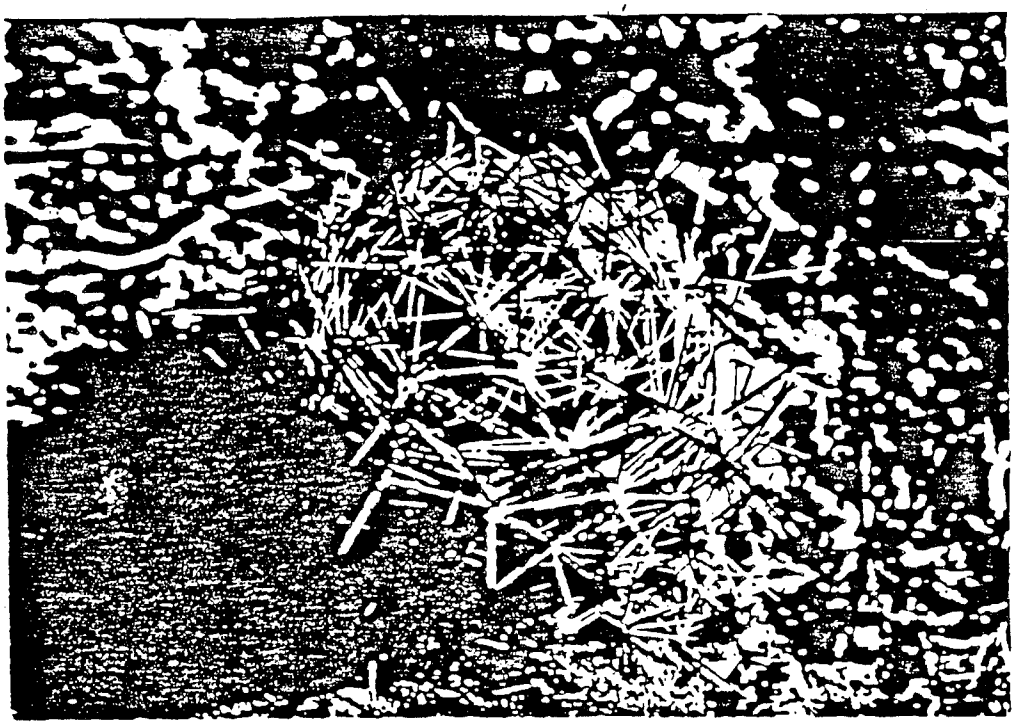
7. and 8. Healthy shortgrass prairie communities. Blue grama grass, buffalo grass, prickley pear cactus, sand sage, rabbitbrush, prairie baby's breath and fringed sage can be seen here (Rocky Mountain Arsenal)

fringed sage, rabbitbrush, prairie baby's breath, blazing star, sand lily and geranium, among others (Appendix B-2). These communities are special for the Colorado high plains in their stability and high coverages of native plants. The shortgrass prairie supports wildlife, which includes prairie dogs, burrowing owls, jack rabbits and coyotes.

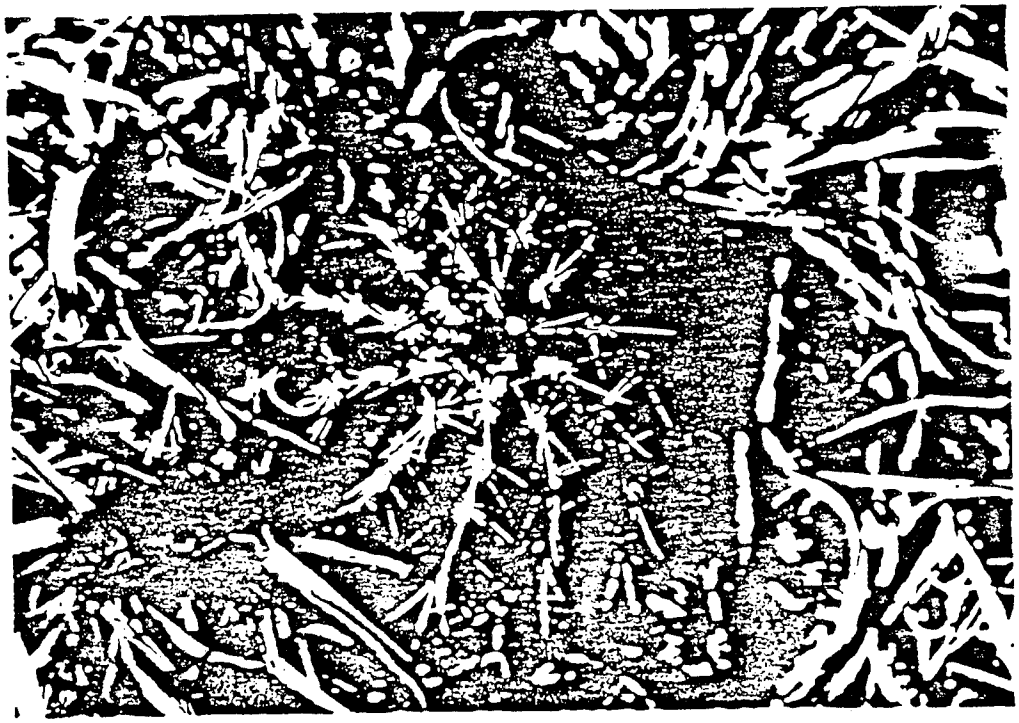
In the endangered, threatened and rare plant list all cactus except Opuntia spp. are considered protected plants because of the pressures of depletion by collection. In the two healthiest communities (sections 19, 24 and 35) two cactus, Mamillaria vivipara (pincushion cactus) and Echinocereus viridiflorus (hedgehog cactus), are found (Photographs 9 and 10).

b. The vegetation around the Lake Mary, Ladora Lake and Rod and Gun Club Pond (sections 2 and 12) shows great disturbance (Photographs 11, 12 and 13). The major dominant plants are Canadian thistle, white sweetclover, evening primrose, mullein, hedge nettle, smartweed and both showy and marsh milkweeds, among other disturbance indicators (Appendix B-5). The eastern end of Ladora Lake, however, appears to be less disturbed and consists of a marshy cat-tail community.

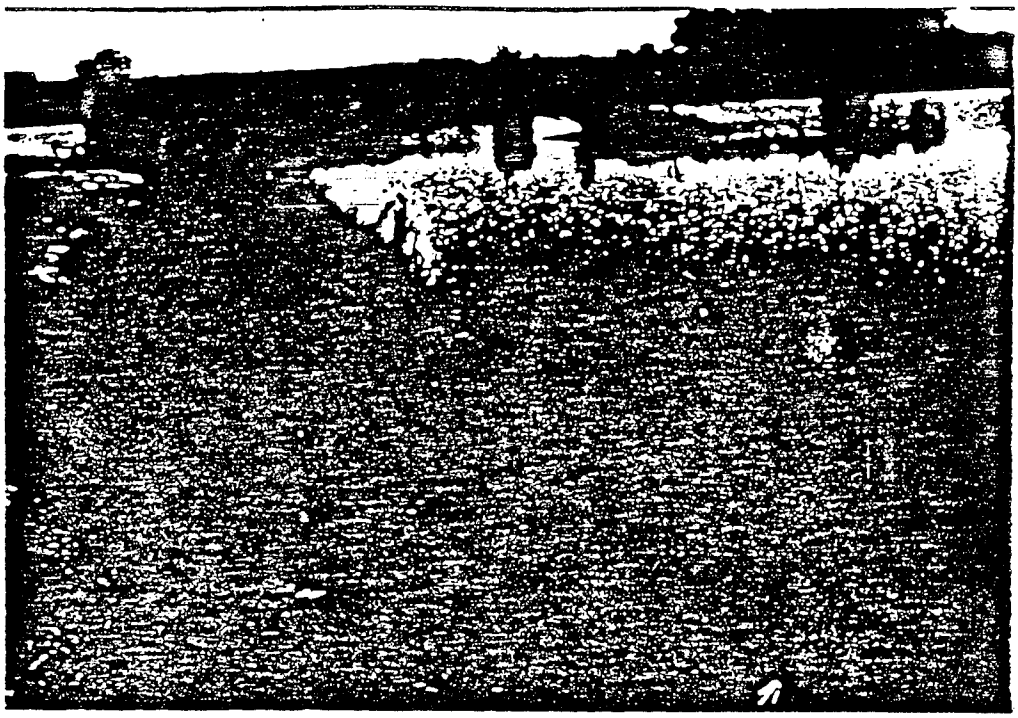
Wildlife is abundant. Waterfowl, hawks and owls, among many other animals, can be found here. Water is one factor causing the presence of these animals in the area, but the vegetation, however disturbed it may be, provides both cover and food.



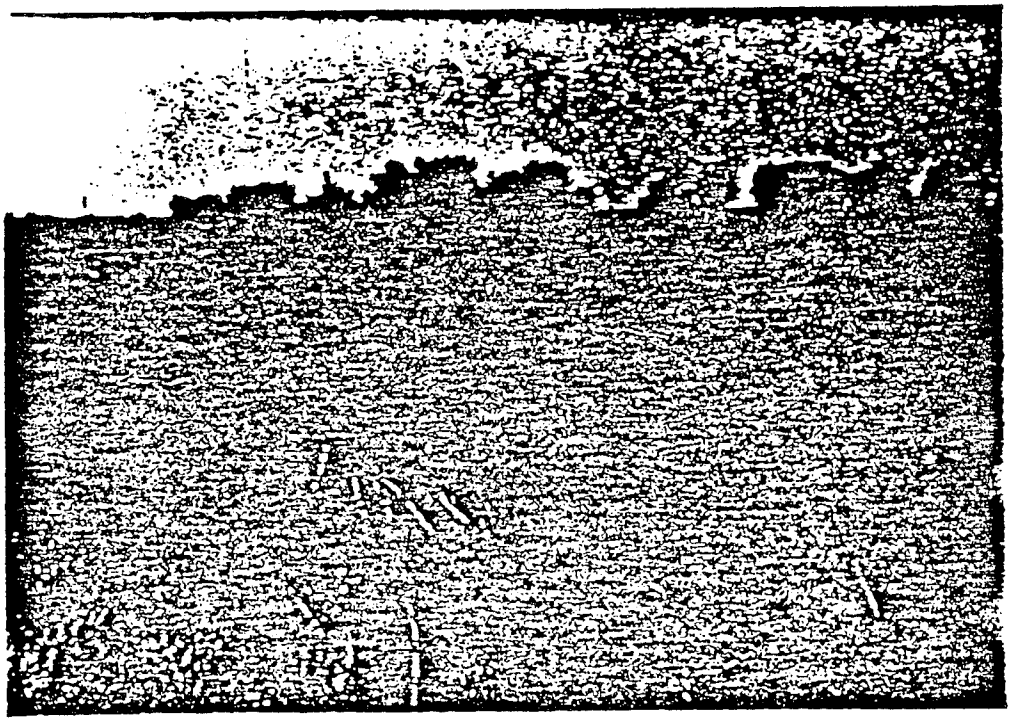
9. Mamillaria vivipara (pincushion cactus) (Rocky Mountain Arsenal)



10. Echinocereus viridiflorus (hedgehog cactus) (Rocky Mountain Arsenal)



11. Lake Mary. Note extremely disturbed lake shore (Rocky Mountain Arsenal)



12. Ladora Lake. Disturbed lake shore with milkweeds, white sweet-clover and sunflowers (Rocky Mountain Arsenal)

13. Ladora Lake with disturbance indicators such as sunflower, white sweetclover, canadian thistle and cheat grass (Rocky Mountain Arsenal)

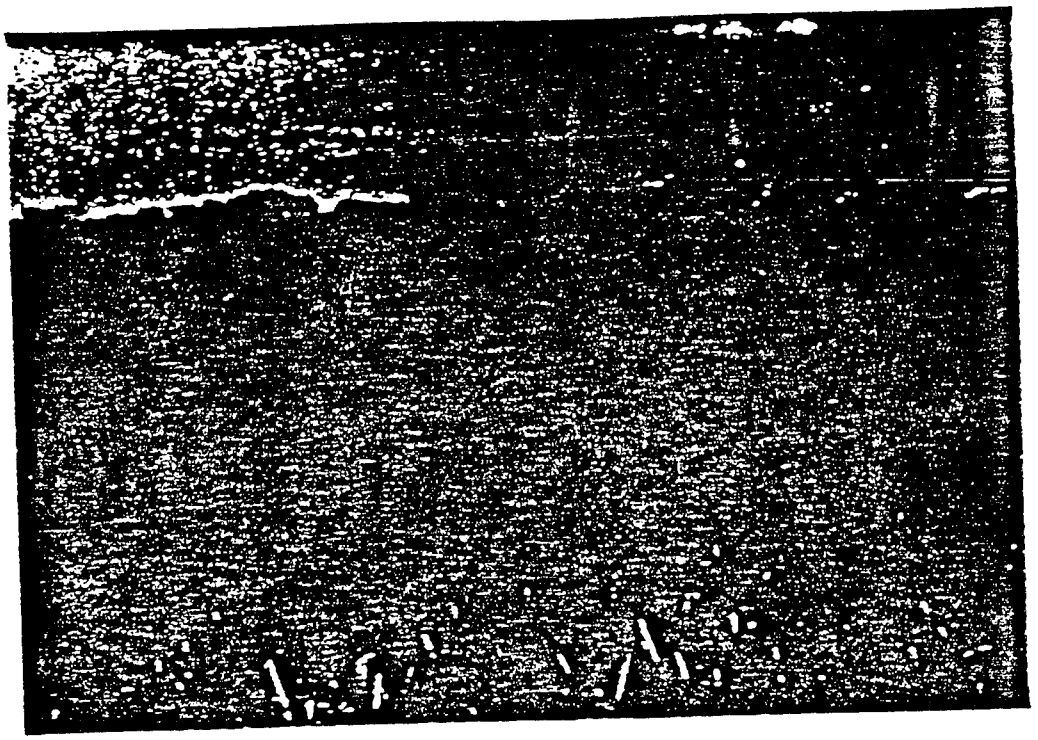
14. Healthy sand sage community. Sand sage, needle and thread grass and sand dropseed can be seen here (Rocky Mountain Arsenal)

c. The next study area includes several sand sage communities (sections 1, 11 and 8). These are relatively undisturbed sites of sandy soil on the southern end of the Rocky Mountain Arsenal and just south of Lower Derby Lake. Sand sage is generally the dominant plant with the dominant grasses consisting of needle-and-thread grass and sand dropseed. Other grasses include red three-awn, blue grama grass, Canadian wild rye and cheat grass. Sand reed grass grows in moist spots, prairie baby's breath, rabbitbrush, yucca, prickly poppy, evening star flower and prickly pear cactus are other common plants (Appendix B-3). The communities are very close in composition to their natural state, as described by Weaver and Albertson (1956), among others (Photograph 14).

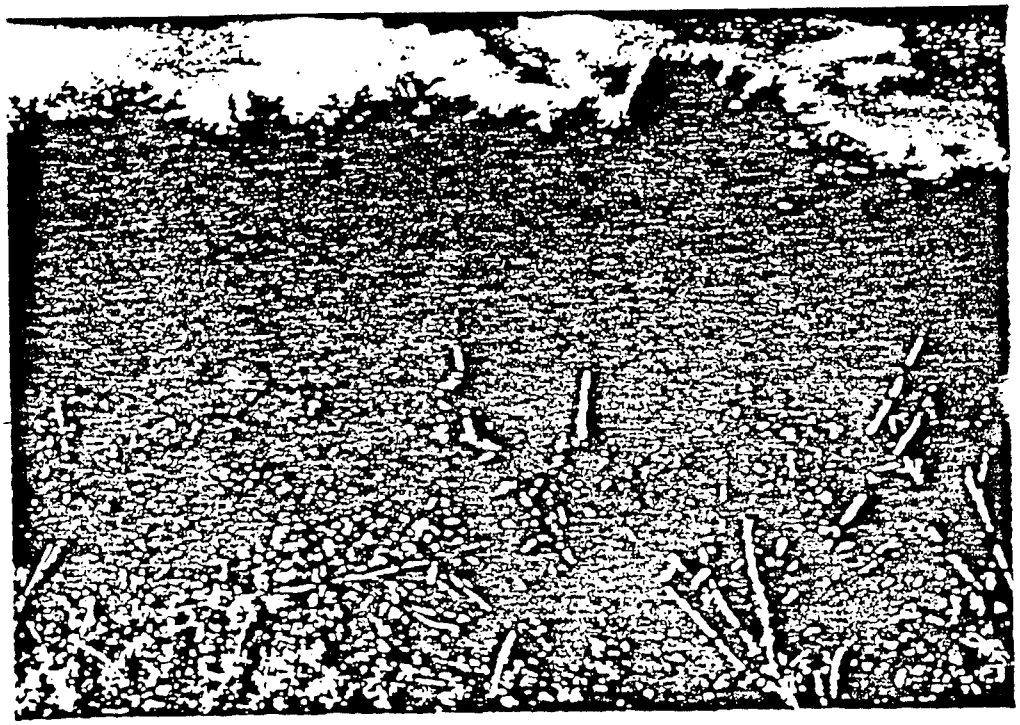
In section 11, several locust thickets grow among the sand sage communities (Photographs 15 and 16). The vegetational composition of these thickets is not special. The locust trees have probably escaped from initial colonies planted years ago (prior to the 1942 occupation by the Army). Within these thickets grow many of the sand sage community species, as well as lilacs, wild rose and wild asparagus.

Long-eared owls modify and utilize the abandoned magpie nests found in the locust trees here (Photograph 17). Therefore, this makes a very important nesting habitat for the owls.

W, C

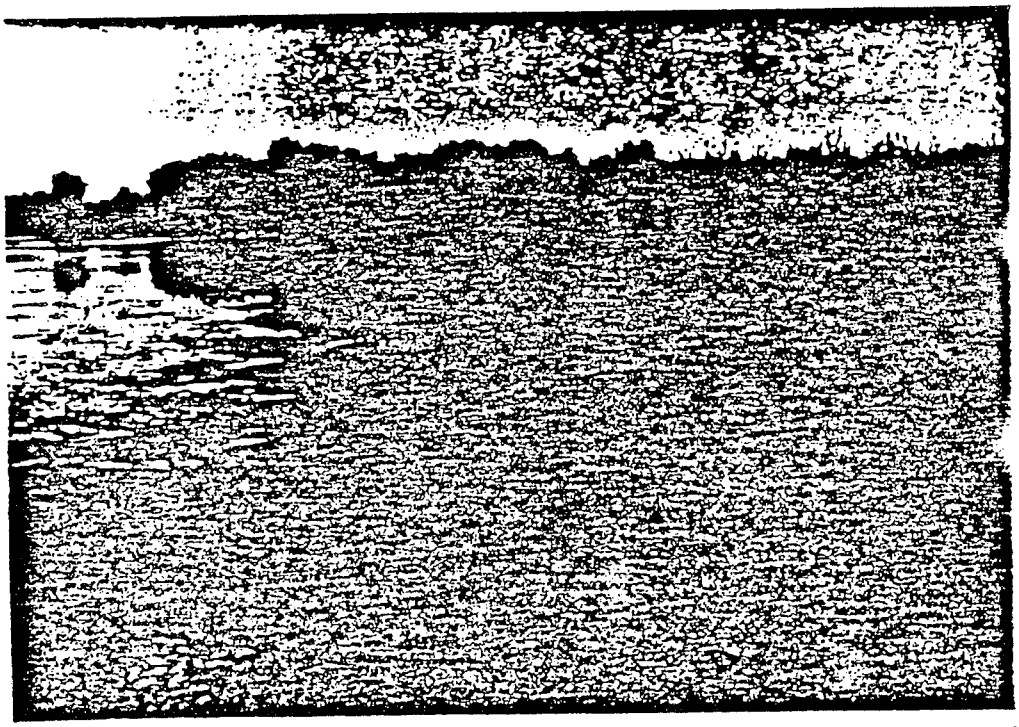


15. Healthy sand sage community with interspersed locust thickets and cottonwood or peach-leaf willow communities (Rocky Mountain Arsenal)



16. Locust thicket with yucca in the foreground (Rocky Mountain Arsenal)

17. Long-eared owl nest in locust tree (Rocky Mountain Arsenal)



18. Cat-tail community at Lower Derby Lake (Rocky Mountain Arsenal)

d. The Lower Derby and Upper Derby Lakes lie in sections 1 and 6 and share the same basic vegetation. Broad-leaved cat-tails, narrow-leaved cat-tails and great bulrush line their shores (Photograph 18). Cottonwoods and peach-leaf willows surround each lake. A peach-leaf willow thicket near Upper Derby Lake (Photograph 19) has a thick understory coverage with mock cucumber vines as well as grasses and forbs found around the lakes. These are sedges, rushes, and grasses such as canary grass and barnyard grass. Forbs include several smartweeds, mint, common plantain, milkweeds and white sweet-clover (Appendix B-4).

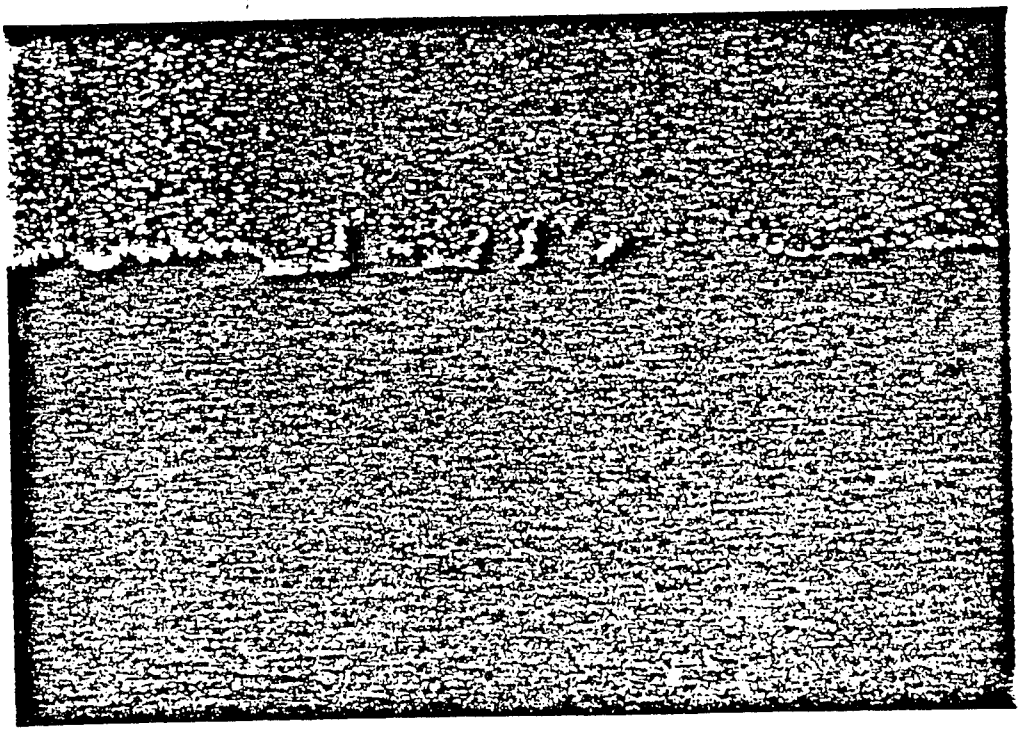
These plant communities indicate a fair amount of disturbance in certain areas, but this disturbance is not as severe as that found in the Lake Mary and Ladora Lake area.

The plant communities here support numerous forms of wildlife in greater abundance than any of the other areas surveyed (including Mile High Lakes). Waterfowl nest among the cat-tails and can be seen in groups on the lake (Photograph 20). Great blue herons, the white egret and white pelican are seen visiting the lakes. Great horned owls nest in the cottonwoods, marsh hawks nest in the area. Herds of deer are seen, coyotes visit the area to hunt. The beauty here is unquestionable (Photograph 21).

W.L.

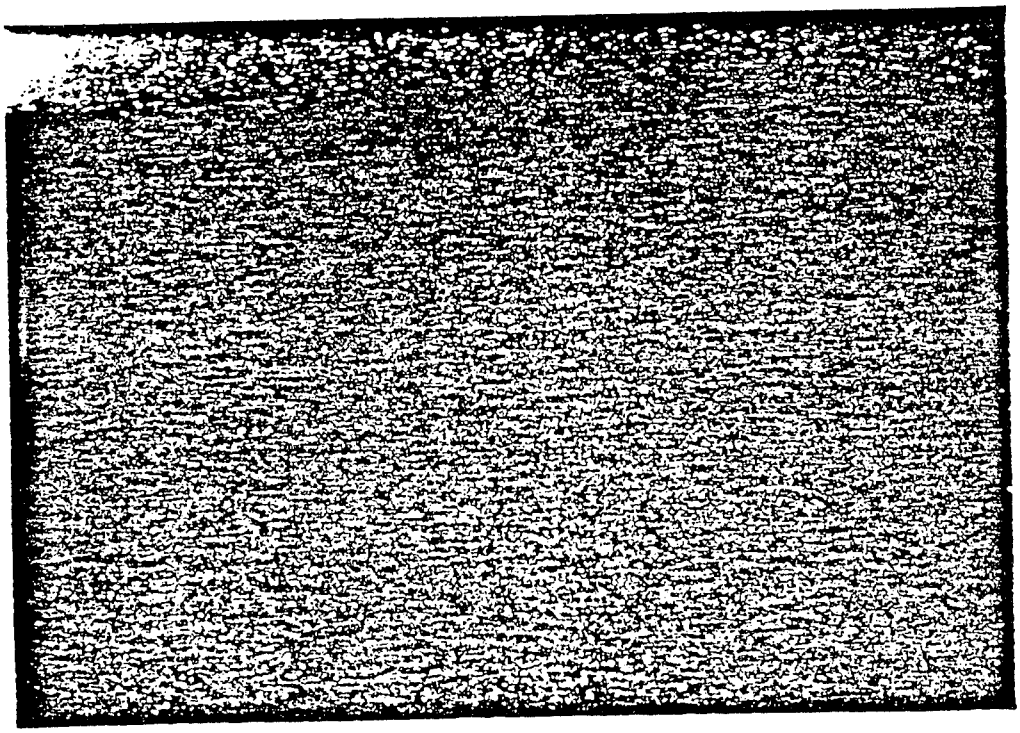
e. The First Creek drainage and the Derby canals (Photograph 22) are not considered special in their composition (Appendix

19. Peach-leaf willow thicket near Upper Derby Lake with mock cucumber vines and productive understory (Rocky Mountain Arsenal)



20. Geese on island in Upper Derby Lake (Rocky Mountain Arsenal)

21. Lower Derby Lake taken from a healthy sand sage community south of the lake (Rocky Mountain Arsenal)



22. Marshy area of First creek. Alkali muhley and cat-tails can be seen here (Rocky Mountain Arsenal)

B-5). Some areas of these drainages are extremely disturbed and weedy, but cottonwoods, willows and the structural make-up of the plant communities form a haven for wildlife. The great horned owl, Swainson's hawk and other raptors nest in the trees along these waterways. Raptors are most common along the drainage in sections 19, 24, 25 and 30. Mule deer and white tailed deer, coyote and badgers are just some of the animals observed here.

f. The remainder of the Arsenal area is largely disturbed. Scattered remnants of native plant communities can be found and, of course, the Arsenal wildlife is sometimes seen here, but the basic condition is that of great disturbance. Many areas have been reseeded with crested wheat grass to inhibit soil erosion. Introduced annual forbs and grasses of Appendix B-5 are dominant.

F. CONCLUSIONS

No formally listed endangered or threatened plants or plants of special concern are known to occur within the study area except the cactus (which are protected against collection by state laws). This negative declaration is based on a detailed field survey, interviews with knowledgeable authorities, and a thorough literature search.

Several areas, however, are of particular interest:

-The shortgrass prairie communities in sections 19, 24 and 35.

-The Derby Lakes area in sections 1 and 6.

-The sand sage communities in sections 1, 8 and 11.

The shortgrass area is of interest in preserving a remnant of the old west, although this community type is protected on a large scale in the Pawnee National Grasslands. The Derby Lake area is primarily of interest as wildlife habitat and would be an important addition to an Arsenal-based regional park. The sand sage community is also in a new native state and would add diversity to a high plains interpretive program associated with a regional park.

This potential loss is best characterized by the Recreational Analysis of subtask 15.11 where all the amenity resources of the Arsenal are arrayed and discussed.

APPENDIX A

Potential Plant Genetic Reserves of Special Interest Within the Current Airport Development Sites

The following is an update of the list found in subtask 12.11. It was made with the help of knowledgeable authorities listed in Methodology D1.

TAXA (and comments)	Status*	Authority
Acorus calamus L. A piedmont species formerly along watercourses, now probably extinct.	1	3, 4
Ammannia coccinea Roth. A seldom collected plant of prairie ponds and marshes.	1	4
Amorpha nana Nutt. Very rare.	1	3, 10
Apios americana Medic Extremely rare, probably not in search area.	1	3
Asclepias uncialis Greene Rare.	1	3
Astragalus plattensis Nutt. Wet areas and drying pond margins.	1	1, 10
Bergia texana (Hook.) Seub. Wet areas and drying pond margins.	1	1
*Cactaceae (except the genus Opuntia) Endangered by collection.	1	3
Centunculus minimus L. Very rare, wet areas in prairies.	1	2, 3, 4
Elatine triandra Schkur. Wet areas.	1	1, 2
Eustoma arandiflorum (Raf.) Shinners Wet places, a showy plant subject to collection.	1	1, 3
Gaura neomexicana Woot. var. coloradensis (Rydb. Munz.) Rare.	2	3, 5, 7, 8
Hypoxis hirsuta (L.) Coville Rare.	2	1, 2, 9

TAXA	Status	Authority
Lithospermum croceum Fernald (=L. cardiniense) Possibly in deep sand.	1.	1, 2, 10
Marsilea mucronata A., Br. (M. vestita Hook. & Grev.) Wet areas.	1	3, 6
Plantago elongata Pursh Endangered by loss of wet habitats.	1	4
Psoralea esculenta Pursh	1	1, 2
Psoralea hypogaea Nutt. Locally abundant on sandy places.	1	1, 2, 3
Rotala ramosior (L.) Koehne Fairly common in other states, perhaps overlooked in Colorado, wet areas.	1	4
Salvia azurea Michx. var. arandiflora Benth. Dry plains and hills at northern limits of range.	1	1, 2, 10
Sparganium eurycarpum Engelm. Formerly found along Platte River near Denver, now possibly extinct there.	1	3
Spergularia marina (L.) Griseb. Alkaline plains.	1	1, 2
Utricularia minor L. Shallow water.	1	1, 2, 10

*Status:

1. Plants that are candidates for federal or state threatened or endangered lists in the foreseeable future, or of special interest because little is known about them.

2. Plants of special concern on official state lists, including rare, vulnerable, isolated, or endemic species.

Authority:

1. Plant Information Network

2. Harrington, 1964

3. Weber, 1976

4. Weber, personal communication
5. D. Wilkin, personal communication
6. Bill Harmon, personal communication
7. Ellis et al., 1979
8. Ecology Consultants, 1978
9. C. Postmueller, personal communication
10. Miriam Denham, personal communication

APPENDICES B (1-5).

1. The following tables show the major dominant plants of various communities under study. They do not portray all of the plants found in these communities and may be lacking some of the spring and summer species, as this survey was done in the fall (September and October).

The following communities are detailed:

Table 1. Cat-tail, bulrush and drier land communities of the Mile High Lakes.

Table 2. Shortgrass prairie communities of Rocky Mountain Arsenal.

Table 3. Sand sage communities of Rocky Mountain Arsenal.

Table 4. Upper and Lower Derby Lakes and a peach-leaf willow thicket near Upper Derby Lake, Rocky Mountain Arsenal.

Table 5. Lakes Mary, Ladora, Rod and Gun Club Pond, First Creek, Derby canals, and other dry "weedy" areas of Rocky Mountain Arsenal.

2. Coverage estimates of dominant species were conducted for the plant communities listed to evaluate their conditions. The coverage estimation technique used here is from Daubenmire, Rexford F., 1969, Plant Communities: A Textbook of Plant Synecology, Harper and Row, N.Y.

Coverage classes are shown in each chart. Their range of coverage percentages are shown below:

Coverage class	Range of Coverage
1	0-5%
2	5-25%
3	25-50%
4	50-75%
5	75-95%
6	95-100%

APPENDIX B-1

Vegetation of Three Plant Communities of the Mile High Lakes Area.

TAXA	Coverage Class: Wet Cat-Tail Communities	Wet Bulrush Communities	Drier Land Communities
Argemone intermedia Sweet (Prickly poppy)	1	1	1-2
Asclepias incarnata L. (Marsh milkweed)	2	1	1
Asclepias speciosa Torr. (Showy milkweed)	1	1	2
Aster spp. (Aster)	1	1	1-2
Bromus tectorum L. (Cheat grass)	1	1	2
Cirsium arvense L. (Canadian thistle)	1-2	1-2	2-4
Distichlis stricta (Torr.) Rydb. (Salt Grass)	1	1	2
Elaeagnus angustifolia (Russian olive)	1	1	2
Kochia scoparia (L.) Schrad. (Summer cypress)	1	1	1-2
Melilotus alba Desr. (White sweetclover)	1	1	2-5
Plantago major L. (Common plantain)	1	1	1
Polygonum persicaria L. (Smartweed)	1-2	2	2
Polypogon monspeliensis L. (Rabbitfoot grass)	1	1	12
Populus sargentii Dode. (Cottonwood)	1	1	2
Salix spp. (Willow)	1	1	2

TAXA	Coverage Class: Wet Cat-Tail Communities	Wet Bulrush Communities	Drier Land Communities
Salsola kali L. (Tumbleweed)	1	1	2-5
Scirpus americana Pers. (Three square)	1	1-2	1
Scirpus lacustris L. ssp. validus Vahl. (Great bulrush)	1-2	3-5	1
Trifolium spp. (Clover)	1	1	1-2
Typha latifolia L. (Broad-leaved cat-tail)	4-5	1-2	1

APPENDIX B-2

Vegetation of Shortgrass Prairie Communities
Found in Sections 19, 24, 33 and 35 of the
Rocky Mountain Arsenal

TAXA	Coverage Class
Antennaria obvata E. Nels. (Pussytoes)	1
Aristida longiseta Steud. (Red three-awn)	1
Artemisia frigida Willd. (Fringed sage)	2
Aster spp. (Aster)	1
Bouteloue gracilis (H.B.K.) Lag. (Blue grama-grass)	3-4
Bromus tectorum L. (Cheat grass)	1
Buchloe dactyloides (Nutt.) Engelm. (Buffalo grass)	3-4
Chrysothamnus spp. (Rabbitbrush)	2
Echinocereus viridiflorus Engelm. (Hedgehog cactus)	1
Eriogunum effusum Nutt. (Prairie baby's breath)	2
Erysimum asperum (Nutt.) D.C. (Western wallflower)	1
Geranium pusillum Burm. (Wild geranium)	1
Leucocrinum montanum Nutt. (Sand lily)	1
Liatris punctata Hook. (Blazing star)	1
Mamillaria vivipara (Nutt.) (Pincushion cactus)	1

TAXA	Coverage Class
Menzelia nuda (Pursh) T. & G. (Evening star flower)	1
Opuntia spp. (Prickly pear cactus)	2
Yucca glauca Nutt. (Yucca)	2

APPENDIX B-3

Vegetation of Sand Sage Communities Found in Sections 1, 8 and 11 - Rocky Mountain Arsenal (Including Locust Thickets)

TAXA	Coverage Class
Argemone intermedia Sweet (Prickly poppy)	1
Aristida longiseta Steud. (Red three-awn)	1
Artemesia filifolia Torr. (Sand sage)	3
Artemesia frigida Willd. (Fringed sage)	1
Asparagus officinalis L. (Wild asparagus) (Locust community only)	1
Bouteloua gracilis (H.B.K.) Lag. (Blue grama-grass)	1
Bromus tectorum L. (Cheat grass)	2
Calamovilfa longifolia (Hook.) Scribn. (Prairie sand reed)	2
Chrysothamnus spp. (Rabbitbrush)	2
Elymus canadensis L. (Canadian wild rye)	1
Eriogonum effusum Nutt. (Prairie baby's breath)	2
Erysimum asperum (Nutt.) D.C. (Western wallflower)	1
Lupinus plattensis S. Wats (Lupine)	1
Lygodesmia juncea (Pursh) D. Don (Skeleton plant)	1
Mentzelia nuda (Pursh) T. & G. (Evening star flower)	1-2

TAXA	Coverage Class
Opuntia spp. (Prickly pear cactus)	1
Panicum virgatum L. (Switch grass)	1
Physalis spp. (Ground cherry)	
Psoralea tenuiflora (Pursh) Rydb. (Psoralea)	1
Robina pseudoacacia L. (Locust) (Locust community only)	4
Rosa spp. (Wild rose) (Locust community only)	1
Sisymbrium altissimum L. (Tumble mustard)	1
Sporobolus cryptandrus (Torr.) Gray (Sand dropseed)	3
Stipa comata Trīu. & Rupr. (Needle-and-thread grass)	3

APPENDIX B-4

Vegetation of Upper and Lower Derby Lakes
and Peach-leaf Willow Thicket Near Upper Derby Lake
Rocky Mountain Arsenal

TAXA	Coverage Class
Asclepias incarnata L. (Marsh milkweed)	1
Asparagus officinalis L. (Wild asparagus)	1
Bromus tectorum L. (Cheat grass)	1
Carex spp. (Sedges)	2-3
Cirsium arvense L. (Canadian thistle)	1
Echinochloa crusgalli (L.) Beuv. (Barnyard grass)	1-2
Echinocystis labata (Michx.) T. & G. (Mock cucumber) (Willow thicket only)	3
Juncas spp. (Rushes)	1-2
Juncas torreyi Cov.	1
Malva neglecta Wallr. (Common mallow)	1-2
Mentha spp. (Mint)	1
Panicum virgatum L. (Switch grass)	1-2
Phalaris canariensis L. (Canary grass)	1-2
Plantago major L. (Common plantain)	1
Polygonum spp. (Smartweed)	2
Polypogon monspeliensis L. (Rabbits-foot grass)	1

TAXA	Coverage Class
Populus sargentii Dode. (Cottonwood)	2-4
Salix amygdaloides Anderss. (Peach-leaf willow)	2-4
Salix spp. (Willows)	2
Scirpus americanus (Three square)	2
Scirpus lacustris L. ssp. validus Vahl. (Great bulrush)	3
Typha angustifolia L. (Narrow-leaved cat-tail)	2
Typha latifolia L. (Broad-leaved cat-tail)	4

APPENDIX B-5

Vegetation of Areas Being Given Minimal Exclusionary Ratings on the Basis of the Composition of Their Plant Communities. These Areas Include Lake Mary, Ladora Lake, Rod and Gun Club Pond, First Creek, the Derby Canals and the Remaining Drier and Disturbed Arsenal Areas - Rocky Mountain Arsenal

TAXA	Lakes Mary, Ladora, & Rod & Gun Club Pond	First Creek Derby Canals	Dry, "Weedy" Areas
Asclepias speciosa Torr. (Showy milkweed)	2	2	1
Bromus tectorum L. (Cheat grass)	1	2	2-3
Cardaria draba (L.) Desv. (Whitetop mustard)	1	2	2
Chenopodium spp. (Goosefoot)	1	2	2
Cirsium spp. (Thistle)	3-5	3-5	3-5
Conium maculatum L. (Poison hemlock)	1	1	1
Convolvulus arvensis L. (Wild morning glory)	1	1	2
Distichlis stricta (Torr.) Rydb. (Salt grass)	1	1-2	1
Echinochloa crusgalli (L.) Beuv. (Barnyard grass)	1	1	1
Gaura neo-mexicana Wooton. (Tall gaura)	1	1-2	1-2
Gnaphalium wrightii A. Gray (Everlasting)	1-2	1	1
Helianthus spp. (Common sunflower)	2-3	1	2-5
Kochia scoparia (L.) Schrad. (Summer cypress)	2	1	2-3
Malva neglecta Wallr. (Mallow)	1	1	1

TAXA	Lakes Mary Ladora, & Rod & Gun Club Pond	First Creek Derby Canals	Dry "Weedy" Areas
Melilotus alba Desr. (White sweetclover)	3-5	2-5	2-5
Melilotus officinalis (L.) Lam (Yellow sweetclover)	2	2	2
Mentha spp. (Mint)	2	2	1
Muhlenbergia asperifolia (Nees & Mey) Parodi (Alkali muhley)	1	2-3	1
Oenothera strigosa (Rydb.) Mack & Bush (Evening primrose)	3	2	1
Panicum capillare L. (Witch grass)	1	1	1-2
Phalaris canariensis L. (Canary grass)	1	1-2	1
Polygonum spp. (Smartweed)	1	2	1
Populus sargentii Dode. (Cottonwood)	2	2	1
Salix spp. (Willow)	3	2-3	1
Salsola kali L. (Tumbleweed)	1	1	2-4
Scirpus americanus Pers. (Three square)	1	2	1
Stachys palustris L. (Hedge nettle)	1-2	1	1
Typha latifolia L. (Broad-leaved cat-tail)	1-5	1-5	1
Verbascum thapsus L. (Mullein)	2	1	2
Xanthium italicum Moretti (Cocklebur)	1	1	1